

REMARKS/ARGUMENTS

In view of the foregoing amendments and the following remarks, the applicants respectfully submit that the pending claims are not anticipated under 35 U.S.C. § 102 and are not rendered obvious under 35 U.S.C. § 103. Accordingly, it is believed that this application is in condition for allowance. **If, however, the Examiner believes that there are any unresolved issues, or believes that some or all of the claims are not in condition for allowance, the applicant respectfully requests that the Examiner contact the undersigned to schedule a telephone Examiner Interview before any further actions on the merits.**

The applicants will now address each of the issues raised in the outstanding Office Action.

Objections

Claim 15 is objected to because of a minor informality. Claim 15 has been amended in accordance with the Examiner's helpful suggestion.

Rejections under 35 U.S.C. § 102

Claim 1 stands rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,747,971 ("the Hughes patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Claim 1 is not anticipated by the Hughes patent because the Hughes patent does not teach a method for

matching a non-empty virtual output queue (VOQ) of the input module with an outgoing link in the input module, and further matching the outgoing link (of the input module) with an outgoing link of one of the central modules. The Examiner cites column 6, line 64 through column 7, line 4 as teaching these acts. The applicants respectfully disagree.

The Hughes patent merely teaches a method where a request controller 314 (which the Examiner contends is an arbiter) constructs a switch frame 315a-h (See Figure 3 of the Hughes patent.), where each switch frame contains service requests for selected cells queued in the ingress port 304a (input module). Frames 315a-h are sent to the switch planes 309a-h (central modules). (See col.6, lines 64-67; col.7, lines 1-4, and Figure 3 of the Hughes patent.) The Examiner has clarified her position that each of the schedulers 314 is known to match an outgoing link from an ingress port with an outgoing link of a central module 309. (See Paper No. 07072005, page 8.)

At best, the Hughes patent shows matching a non-empty VOQ 312a-312n and 313 with a switch plane 309a-h (central module). ***It does not match the outgoing link (of the input-module) with an outgoing link of one of the central modules.*** Thus, claim 1 is not anticipated by the Hughes patent for at least this reason.

Further, the Hughes patent does not teach that high throughput can be achieved without speedup at the central modules. Although the Hughes patent discusses speedup, it is apparently using speedup in a different context. (The Hughes patent teaches a method wherein a speedup mode is available. Speedup accelerates service for a specific queue. The acceleration is achieved by ensuring

that every cell within the queue is mapped as a primary service request (highest priority). Thus speedup applies to a queue rather than a cell wherein all cells in the queue are given the highest priority. (See col.23, lines 41-52.))

The Examiner contends that since column 7, lines 16-30 indicates that each central module contains a scheduler, high switching throughput is achieved using parallel processing, without speedup. (See Paper No. 07072005, page 3.) However, one skilled in the art would appreciate that speedup concerns the **relative** transmission rates **of components of the switch** (e.g., line rate versus switch fabric rate), not whether slower parallel processors are used instead of a single, faster, processor. When interpreting the term "speedup," the Examiner must consider the specification as it would be interpreted by one of ordinary skill in the art.

Phillips v. AWH Corp., 75 U.S.P.Q.2d 1321 (Fed. Cir. July 12, 2005) (en banc). Thus, claim 1 is not anticipated by the Hughes patent for at least this additional reason.

Rejections under 35 U.S.C. § 103

Claims 2-5, 7-14, 16 and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Hughes patent in view of U.S. Patent No. 6,285,679 ("the Dally patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

The Examiner concedes that the Hughes patent does not teach an arbiter for each of the outgoing links of the input module. In an attempt to compensate for this admitted deficiency, the Examiner relies on the Dally

patent. In particular, the Examiner contends that the Dally patent teaches an arbiter for each of the outgoing links of the input module, citing Figure 9, element 68. The Examiner then concludes that it would have been obvious to one skilled in the art to modify the Hughes method by incorporating arbiters at each outgoing link, **so as to provide a fair arbitration process** for access to requested output links. (See Paper No. 07072005, page 4.) The applicants respectfully disagree.

One skilled in the art would not have been motivated to combine the Hughes and Dally patents as proposed by the Examiner. There is no suggestion in the art to make the proposed combination. As just stated above, the Examiner concludes that it would have been obvious to one skilled in the art to modify the Hughes method by incorporating arbiters at each outgoing link, **so as to provide a fair arbitration process** for access to requested output links. **However, the Hughes method is already fair.** For example, the Hughes patent states:

For fairness the scheduler maintains a number of pointers (not shown). The pointers help determine: 1) whether a multicast request is to be preferred or not (the Multicast/Unicast Grant Preference Pointer); 2) which multicast request to select if more than one exists (the Multicast Grant Round Robin Pointer); and 3) which unicast request to select if more than one exists (the Unicast Grant Round Robin Pointer). [Emphasis added.]

Column 18, lines 3-10. The Hughes patent further states:

The Multicast Grant Round Robin Pointer and the Unicast Grant Round Robin Pointers are used to guarantee 100% fairness to all ingress ports.

That is, whereas the Multicast/Unicast Grant Reference Pointer determines contention between multicast and unicast cells, the round robin pointers determine contention among ingress ports. The preference ranking scheme consists of a list of n numbers listed sequentially. The pointer rolls the preference ranking scheme one unit each time the preference ranking is used. If the output control port has to choose between two requests from two or more different ingress queues it will select the ingress port listed highest in the preference ranking scheme. After the selection is made, the preference ranking is shifted one unit. Thus the ranking continually wraps around which, over time, guarantees 100% fairness to all ingress ports. In one embodiment there is one multicast Grant Round Robin Pointer per switch plane and one Unicast Grant Round Robin Pointer per output control port. Also, the input control port, if it receives more than grant may also use the reference and round robin pointers to resolve multiple grant contention after it first determines which grants are highest priority according to the currently active preference ranking scheme (as discussed in regards to FIG. 10). [Emphasis added.]

Column 18, lines 32-54.

Since the method described in the Hughes patent is already fair (100% fairness can be guaranteed), one skilled in the art would not have been motivated to modify it for purposes of fairness. Furthermore, since the Dally patent describes a very different technique and architecture from the Hughes patent, one skilled in the

art would not have been motivated to apply a component of the Dally patent to the Hughes patent since doing so would run the very high risk of adversely affecting the operation of the Hughes patent.

Since one skilled in the art would not have been motivated to combine the Hughes and Dally patents, claims 2-5, 7-14, 16 and 35 are not rendered obvious by these patents for at least this reason.

Moreover, the even assuming, *arguendo*, that one skilled in the art would have been motivated to combine the Hughes and Dally patents as proposed by the Examiner, the proposed combination would still not compensate for the deficiencies of the Hughes patent with respect to claim 1, as discussed above. Since claims 2-10 and 35 depend from claim 1, these claims are not rendered obvious by these patents for at least this additional reason.

Claims 6 and 15 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Hughes patent in view of U.S. Patent, in view of U.S. Patent No. 6,154,459 ("the Wicklund patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

First, since claims 6 and 15 depend from claims rejected as being unpatentable over the Hughes patent **and the Dally patent**, the applicants assume that the Examiner intended to reject these claims over the Hughes, Dally and Wicklund patents.

The Examiner cites the Wicklund patent as teaching moving a pointer through groups of VOQs. Even assuming, *arguendo*, that this is true, this purported teaching of

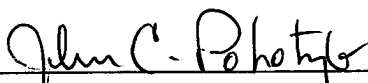
the Wicklund patent fails to compensate for the deficiencies of the Hughes and Dally patents with respect to claims 1, 2, 5, 11 and 14 discussed above. Dependent claim 6 includes the features of claims 1, 2 and 5, while dependent claim 15 includes the features of claims 11 and 14. Therefore, claims 6 and 15 are not rendered obvious by the Hughes, Dally and Wicklund patents for at least this reason.

Conclusion

In view of the foregoing amendments and remarks, the applicants respectfully submit that the pending claims are in condition for allowance. Accordingly, the applicants request that the Examiner pass this application to issue.

Respectfully submitted,

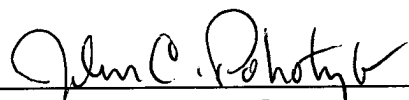
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I hereby certify that this correspondence is being deposited on **January 12, 2006** with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



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